

## TECHNICAL BASIS FOR TIER I OPERATING PERMIT

**DATE:** December 23, 2002

**PERMIT WRITER:** Darcy Sharp

**PERMIT COORDINATOR:** Bill Rogers

**SUBJECT:** AIRS Facility No. 001-00044, Micron Technology, Inc., Boise  
Final Tier I Operating Permit

<b>Permittee:</b>	Micron Technology, Inc.
<b>Permit Number:</b>	001-00044
<b>Air Quality Control Region:</b>	064
<b>AIRS Facility Classification:</b>	A1
<b>Standard Industrial Classification:</b>	3674
<b>Zone:</b>	11
<b>UTM Coordinates:</b>	569.0, 4819.7
<b>Facility Mailing Address:</b>	8000 South Federal Way, Boise, ID 83707
<b>County:</b>	Ada
<b>Facility Contact Name and Title:</b>	Rob Sterling, Environmental Manager
<b>Contact Name Phone Number:</b>	(208) 368-5197
<b>Responsible Official Name and Title:</b>	Steve Stout, Vice President, Facilities
<b>Exact plant Location:</b>	Latitude 43° 31' 45", Longitude 116° 08' 47"
<b>General Nature of Business &amp; Kinds of Products:</b>	Semiconductor manufacturing

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## LIST OF ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AP-42	compilation of air pollution emission factors
AQCR	Air Quality Control Region
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
DI	deionized
dscf	dry standard cubic feet
EPA	U. S. Environmental Protection Agency
ft <sup>3</sup>	cubic feet
gr	grain (1 lb = 7,000 grains)
HAPs	hazardous air pollutants
Hg	mercury
hr	hour
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
in	inch
km	kilometer
lb	pound
m <sup>3</sup>	cubic meter
MACT	Maximum Available Control Technology
MMBtu/hr	million British thermal units per hour
MTI	Micron Technology, Inc.
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter of 10 micrometers or less
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
scf	standard cubic feet
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

## **PUBLIC COMMENT / AFFECTED STATES / EPA REVIEW SUMMARY**

A 30-day public comment period for the Micron Technology, Inc. (MTI), draft Tier I operating permit was held as required by IDAPA 58.01.01.364 (*Rules for the Control of Air Pollution in Idaho*). The public comment period ran from October 12 through November 12, 2002. A public hearing was held November 12, 2002. MTI was the only entity to provide comments. Those comments and the Departments responses are presented as the appendix of this document.

IDAPA 58.01.01.008.01, defines *affected states* as: "*All states: whose air quality may be affected by the emissions of the Tier I source and that are contiguous to Idaho; or that are within 50 miles of the Tier I source.*"

A review of the site location information included in the permit application indicates that the facility is located with 50 miles of a state border. Therefore, the state of Oregon was provided an opportunity to comment on the draft Tier I operating permit.

A proposed permit was developed and forwarded to the EPA for their review as required by IDAPA 58.01.01.366. The EPA provided no written objection.

## 1. **PURPOSE**

The purpose of this memorandum is to explain the legal and factual basis for this draft Tier I operating permit in accordance with IDAPA 58.01.01.362, *Rules for the Control of Air Pollution in Idaho*.

The DEQ has reviewed the information provided by MTI regarding the operation of their facility located in Boise, Idaho. This information was submitted based on the requirements to submit a Tier I operating permit application in accordance with IDAPA 58.01.01.300.

## 2. **SUMMARY OF EVENTS**

- April 24, 1995 - DEQ received the Tier I operating permit application from MTI for their semiconductor manufacturing and support operations facility located in Boise. The application was prepared by MTI.
- June 23, 1995 - DEQ requested additional information.
- July 25, 1995 - MTI supplied the information requested by DEQ.
- August 31, 1995 - DEQ determined the application complete.
- May 1, 1997 - Consent Order issued by DEQ to MTI.
- June 2, 1997 - DEQ received a supplemental application from MTI.
- February 21, 1998 - The application and supplement were determined to be administratively complete.
- August 21, 1998 - Amended Consent Order issued by DEQ to MTI.
- October 1998 - DEQ sent the pre-draft permit, which was based on application and supplement to EPA for comment.
- February 1999 - DEQ received the EPA's comments.
- May 10, 1999 - DEQ received a second supplemental application (Supplement II) from MTI; Supplement II addressed the EPA's comments and included additional information from MTI.
- June 16, 1999 - DEQ received information on MTI's lime storage silo and sodium carbonate storage silo.
- September 24, 1999 - DEQ received MTI's comments on the September 9, 1999 draft permit and technical memorandum.
- October 19, 1999 - MTI provided comments on the draft permit and additional information requested by DEQ.
- November 10 through December 10, 1999 - The first public comment period.
- November 10, 1999 - DEQ published Notice of Public Comment Period and Opportunity for a Public Hearing Regarding an Application to Operate An Air Pollution Emitting Source.
- December 10, 1999 - MTI submitted comments on the proposed permit.
- December 14, 1999 - EPA submitted comments on the proposed permit.
- May 2000 - DEQ told MTI it intended to publish the facility-wide conditions for public comment.
- June 9, 2000 - MTI requested amendments to the consent order to add controls.
- June 12, 2000 - MTI filed responses to EPA's December 14, 1999, comments.
- June 30 and July 6, 2000 - By email, DEQ requested additional information.
- June 29, 2000 - MTI filed a request to renew the Tier II permit.
- August 3, 2000 - DEQ published notice and opportunity for comment on Tier I facility wide conditions.
- August 7, 2000 - MTI supplied information requested by DEQ.

- August 22, 2000 – Second Amended Order issued by DEQ to MTI.
- September 11, 2000 - MTI submitted comments on Tier I facility wide conditions.
- January 11, 2001 - DEQ terminates MTI's Tier II Operating Permit No. 001-00044 for emergency generators.
- January 9, 2002 - DEQ requested all exemption determinations from previous 24 months.
- January 24, 2002 - MTI submitted the information requested by DEQ.
- May 9, 2002 - DEQ returned the information submitted by MTI on January 25, 2002, requested that MTI within 30 days reformat and resubmit the information previously submitted, submit additional information, and reformat and begin to gather additional information for all future applicability determinations.
- May 9, 2002 - DEQ issued guidance regarding 112(j) of the CAA.
- May 9, 2002 - DEQ issues Information Order to MTI for PTC exemption documentation.
- May 15, 2002 - MTI filed Part I Title V Application re CAA 112(j).
- June 25, 2002 - DEQ attends meeting with MTI at Micron. MTI provides detailed presentations on MTI's manufacturing process and MTI's methodology for integration with the Procedures and Requirements for Permits to Construct.
- June 28, 2002 - DEQ suspends Information Order.
- September 12, 2002 – MTI submitted a Tier I application update.
- October 7, 2002 – Third Amended Consent Order issued by DEQ to MTI.

### **3. Basis of the Analysis**

The following documents were used in preparing this memorandum and the Tier I operating permit:

- Tier I operating permit application, received April 24, 1995 from Micron Technology, Incorporated, Boise, Idaho; and supplemental application materials received on June 2, 1997 and May 10, 1999
- Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, January 1995, Office of Air Quality Planning and Standards, EPA
- 40 CFR 70
- IDAPA 58.01.01, *Rules for the Control of Air Pollution in Idaho*
- Guidance developed by the EPA and DEQ
- Information in the DEQ's MTI source file
- Information submitted by MTI dated May 5, 1999, through e-mails dated September 24, 1999, and October 8, 1999, respectively

## **4. FACILITY DESCRIPTION**

### **4.1 GENERAL PROCESS DESCRIPTION**

The following process description is taken from MTI's Tier I operating permit application dated May 10, 1999. MTI manufactures solid state, electrical devices that perform a variety of functions in electronic circuits. These functions include information processing and display, power handling, data storage, signal conditioning, and the interconversion between light energy and electrical energy. The processes at MTI include the basic manufacturing elements of fabrication, assembly, and testing, as well as the associated support operations.

#### **Fabrication**

Silicon wafers received at MTI are chemically cleaned to remove particles and contaminants such as dust. Aqueous acid or acid mixtures are the most commonly used cleaning solutions. The presence of

acids is generally necessary because of the solubility characteristics of silicon, silicon oxide, and common contaminants. The acids used depend on the nature of the contaminants to be removed, which may include HAPs. Aqueous acidic wastes are discharged to the industrial wastewater system.

The next step in the process depends on the type of integrated circuit device being produced, but commonly involves the diffusion or growth of a layer, or layers, of silicon dioxide, silicon nitride, or polycrystalline silicon. Diffusion processes can be conducted at atmospheric pressure or in a vacuum chamber and are typically conducted at elevated temperatures that can range between 400 and 1200°C. Chemicals and gases necessary to obtain the desired effect are flowed for a limited time into the chambers where a reaction takes place, depositing a layer of the element or compound on the surface of the wafer. Wafer residence times in the chambers can vary from several minutes to 24 hours. Several products containing either VOCs or HAPs may be used in the diffusion step depending on the desired composition of the layer. As gases react in the diffusion process, a small amount of particulates can be produced and emitted.

The wafer then proceeds to the photo process. Vapor priming occurs first to remove moisture present on the wafer surface and prepare it for optimum photoresist adhesion. The wafer continues on to coat tracks where it is coated with a photoresist, a photosensitive emulsion, followed by a rinse to remove excess photoresist from the edges and back of the wafer. The wafer is next exposed to ultraviolet light using glass photomasks that allow the light to strike only selected areas and depolymerize the photoresist in these areas. After exposure to ultraviolet light, exposed photoresist is removed from the wafer on develop tracks and rinsed off with DI water. Photoresist allows subsequent processes to affect only the exposed portions of the wafer. All photo processes are conducted at atmospheric pressure with some processes conducted at ambient temperatures, and others at elevated temperatures ranging up to 150°C. Wafer residence times during chemical application in the photo process can vary from several seconds to 10 or 15 minutes. Excess VOC-containing products that may be used in each photo step may be discarded to the hazardous waste, non-hazardous waste, or industrial wastewater collection systems.

The wafer is then etched to selectively remove deposited layers not protected by the photoresist material. Either dry- or wet-etch processes may be used depending on the type of layer being removed. Dry-etch uses high-energy plasma to remove the target layer. Process gases are ionized under vacuum pressure to form plasmas capable of etching specific layers. Wet-etch may also be used to remove specific layers from the wafer. However, some wet-etch processes also perform cleaning functions and prepare the wafer for subsequent processing. Wet-etch is generally conducted at atmospheric pressure. Both etch processes may be conducted at ambient temperature or elevated temperatures up to 400°C. Chemicals and gases used in both etch processes may be used in varying quantities depending on the specific objective of the etch being conducted. Wafer etching can be conducted anywhere from two minutes to two hours. Some of the VOC- and/or HAP-containing material used in etch processes may be discarded to either the hazardous waste or industrial wastewater collection systems.

Following etching, the wafer moves on to a process where dopants are added to the wafer. Dopants are impurities such as boron, phosphorus, or arsenic. Adding small quantities of these impurities to the wafer substrate alters its electrical properties. Implant and diffusion are two methods currently used to add dopants. During implant, a chemical is ionized and accelerated in a beam to velocities approaching the speed of light. Scanning the beam across the wafer surface implants the energized ions into the wafer. A subsequent heating step, termed annealing, is necessary to make the implanted dopants electrically active. Diffusion is a vapor phase process in which the dopant, in the form of a gas, is injected into a furnace containing the wafers. The gaseous compound breaks down into its elemental constituents on the hot wafer surface. Continued heating of the wafer allows diffusion of the dopant into the surface at controlled depths to form the electrical pathways within the wafer. Solid forms of the dopant may also be used.

Metallization is a process that can be used to add metal layers to a wafer. Sputtering and vacuum deposition are forms of metallization that may be used to deposit a layer of metal on the wafer surface. In the sputtering process, the source metal and the target wafer are electrically charged, as cathode and

anode respectively, in a partially evacuated chamber. The electric field ionizes the gas in the chamber and these ions bombard the source metal cathode, ejecting metal that deposits on the wafer surface. In the vacuum deposition process, the source metal is heated in a high-vacuum chamber by resistance or electron beam heating to the vaporization temperature. The vaporized metal condenses on the surface of the silicon wafer. Some VOCs may be used in the diffusion process, but generally not in the implant or metallization process.

The wafer is then rinsed in an acid or solvent solution to remove the remainder of the hardened photoresist material. A second oxide layer is grown on the wafer and the process is repeated. This photolithographic-etching-implant-oxide process sequence may occur a number of times depending upon the application of the semiconductor. During these processes, the wafer may be cleaned many times in acid solutions followed by DI water rinses and solvent drying. This is necessary to maintain wafer cleanliness. The rinsing and drying steps may involve the use of a VOC- or HAP-containing material.

The wafer-fabrication phase ends with an electrical test (probe). Each die on the wafer is probed to determine whether it functions correctly. Defective die are marked to indicate they should be discarded. A computer-controlled testing machine quickly tests each circuit.

### **Assembly**

After the fabrication processes are completed, the semiconductor chips are assembled into protective packages. The wafers are first mounted on tape in a metal frame where the wafer is sectioned by a wafer saw to separate the individual chips or die. Die are picked off the tape and attached to the bonding pad of a lead frame. Die attach cure ovens heat-treat the die/lead frame assembly for several hours. The die is then connected to the legs of the lead frame by fine bonding wire. A protective coating is applied to the die and hardened in die coat cure ovens. The entire die is then encapsulated with a protective molding compound. The lead frame strip is trimmed and individual die leads are formed. The legs of individual die packages are then plated to provide reliable electrical contacts. Individual die may then be sold as die, or assembled further into memory modules. Several VOC-containing materials are used in the assembly process. Some excess VOC product may be discharged to the hazardous waste collection system. There are no HAP emissions from the assembly process.

### **Test**

After assembly, the complete die are run through a series of tests for classification and final checking. There are several different tests run during this phase. Tests are conducted at varying temperatures to check for early failure of the die and to verify the speed of each die. A final visual check of the die is conducted before they are packaged and shipped. No VOCs or HAPs are used in the testing process.

### **Support Operations**

Numerous other operations are conducted at the MTI facility in support of the manufacturing process. These include:

- natural gas boilers-used to supply steam for general heating and humidification purposes
- cooling towers-used to dissipate heat from non-contact cooling water
- an industrial waste water treatment plant-used to treat manufacturing waste water to levels suitable for either land application or discharge to a publicly owned treatment works
- temporary storage of solid and liquid hazardous waste generated at MTI pending shipment to a licensed offsite treatment, storage, and disposal facility
- storage and dispensing of unleaded gasoline and diesel fuels
- painting and welding in support of new construction and maintenance of existing equipment and facilities



- maintenance of surfaces in production areas by general cleaning activities
- emergency equipment-used in the event of an unexpected loss of power, fire, or other unforeseen disruption of normal life safety systems

## 4.2 FACILITY CLASSIFICATION

This facility is a major facility in accordance with IDAPA 58.01.01.008.10 because the facility emits or has the potential to emit a regulated air pollutant in amounts greater than or equal to 100 T/yr; however, it is not a major source for HAP emissions as of the date of this permitting action. This facility is a major facility as defined in IDAPA 58.01.01.006.55. The fossil fuel-fired boilers, which have more than 250 MMBtu/hr heat input, are a designated facility in accordance with IDAPA 58.01.01.006.27.v. Certain boilers are subject to NSPS requirements in accordance with 40 CFR 60. The SIC defining the facility is 3674 and the AIRS facility classification is A.

## 4.3 AREA CLASSIFICATION

This facility is located in northern Ada County, which is located within AQCR 64. This area is designated nonattainment for CO and unclassifiable for all other regulated criteria air pollutants. There are no Class I areas within 10 km of the facility.

## 4.4 PERMITTING HISTORY

- February 12, 1981 - Initial PTC issued.
- August 18, 1981 - Letter from Mark Masarik, EPA, to Nick Edwards, MTI. Mr. Masarik stated that the EPA would recognize and administer MTI's PTC, as provided in Section III, Other Actions--Permits. Mr. Masarik also stated in the letter that, at EPA discretion and as provided for in Section 1-1902 of the state regulations, the EPA did not intend to issue MTI an operating permit.
- October 9, 1991, DEQ determined that the lime storage silo qualified for a conditional exemption, per IDAPA 16.01.1012.02.h.
- February 13, 1992 - DEQ's permit applicability determination memo recommended that MTI be notified in writing that emissions from the wastewater pond are below regulatory concern.
- April 9, 1993 - DEQ received a letter dated April 8, 1993 from MTI requesting verification that the relocation of laboratory functions falls under the exemption identified in IDAPA 16.01.1012.02.f (*Rules*). MTI also requested notification of any air permitting requirements associated with the proposed joining of two existing buildings. In a separate letter received on the same date, MTI requested an exemption, in accordance with IDAPA 16.01.1012.02.g (*Rules*), for a pilot plant. Also on this date, DEQ staff recommended that MTI be issued a PTC for the Implant Process 10A project. DEQ sent a PTC application, completeness determination checklist, and program and procedures document to MTI for its sodium carbonate silo.
- April 23, 1993 - DEQ determined that the pilot plant project qualified as a pilot or experimental plant in accordance with IDAPA 16.01.01.102.02.g.
- May 20, 1993 - DEQ determined that MTI's laboratory relocation project qualified as a laboratory equipment exemption in accordance with IDAPA 16.01.01012.f.
- June 4, 1993 - DEQ determined that MTI's proposed wastewater reclaim process with additive handling emissions controlled by a baghouse would produce emissions levels below regulatory concern.

- June 14, 1993 - DEQ determined that the Building 24 project would have emissions at levels below regulatory concern, and no air quality permitting requirements would be associated with the proposed project.
- May 10, 1994 - DEQ determined that the emergency equipment given in MTI's letter dated April 5, 1994 qualified for a Category II Exemption in accordance with IDAPA 16.01.01.221.
- May 16, 1994 - DEQ issued amended PTC No. 001-00044 for the proposed modification of Implant Process 10A.
- December 21, 1994 - DEQ issued amended PTC No. 001-00044 per MTI's November 8, 1994 request.
- April 7, 1995 - DEQ reviewed MTI's March 9, 1995 revocation request and determined that the implanters were categorically exempt from PTC requirements in accordance with IDAPA 16.01.01.200 (Rules). Thus, DEQ revoked the original permit and all subsequent modifications of that permit issued on May 16, 1994, December 2, 1994, and December 21, 1994.
- May 15, 1995 - DEQ notified MTI that a public comment period, beginning May 15, 1995 and ending June 14, 1995, would be held for their Tier II operating permit for emergency generators.
- June 23, 1995 - DEQ deemed MTI's Tier I operating permit application incomplete.
- May 3, 1996 - DEQ received MTI's April 17, 1996 request for a permit applicability determination for the proposed change-out of VOC emissions control units.
- February 21, 1997 - DEQ issued amended Tier II Operating Permit No. 001-00044.
- February 21, 1997 - DEQ deemed MTI's Tier I operating permit application complete.
- May 1, 1997 - DEQ issued a Consent Order imposing federally enforceable conditions on VOC abatement units.
- September 14, 1998 - DEQ issued an amended consent order imposing federally enforceable conditions on VOC abatement units.
- September 30, 1998 - DEQ determined that the requirement to record the amount of fuels that each generator consumes might be an obsolete term in Tier II Operating Permit No. 001-00044.
- January 11, 2001 - DEQ terminates MTI's Tier II Operating Permit No. 001-00044 for emergency generators.
- May 9, 2002 - DEQ issues Information Order to MTI for PTC exemption documentation.
- June 28, 2002 - DEQ suspends Information Order
- October 7, 2002 - DEQ issues Third Amended Consent Order to MTI.

#### **4.5 FACILITY-WIDE APPLICABLE REQUIREMENTS**

The following facility-wide requirements apply to all emissions units at the facility. An additional requirement for semiconductor manufacturers that are major for hazardous air pollutants, shall become applicable upon proposal in the Federal Register. The proposal date for 40 CFR 60 Subpart BBBBBB (Semiconductor Manufacturing) is May 15, 2002. This applicable requirement is explained in section 4.5.15.

#### **4.5.1 Fugitive Emissions - IDAPA 58.01.01.650-651, 5/1/1994**

##### **4.5.1.1 Requirement**

Permit Condition 2.1 states that all reasonable precautions shall be taken to prevent PM from becoming airborne in accordance with IDAPA 58.01.01.650-651.

##### **4.5.1.2 Compliance Demonstration**

Permit Condition 2.2 states that the permittee is required to monitor and maintain records of the frequency and the methods used by the facility to reasonably control fugitive particulate emissions. Some examples of ways to reasonably control fugitive emissions, which include using water or chemicals, applying dust suppressants, using control equipment, covering trucks, paving roads or parking areas, and removing materials from streets, are presented in IDAPA 58.01.01.651.

Permit Condition 2.3 requires that the permittee maintain a record of all fugitive dust complaints received. In addition, the permittee is required to take appropriate corrective action as expeditiously as practicable after a valid complaint is received. The permittee is also required to maintain records that include the date that each complaint was received and a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

To ensure that the methods being used by the permittee to reasonably control fugitive PM emissions whether or not a complaint is received, Permit Condition 2.4 requires that the permittee conduct periodic inspections of the facility. The permittee is required to inspect potential sources of fugitive emissions during daylight hours and under normal operating conditions. If the permittee determines that the fugitive emissions are not being reasonably controlled the permittee shall take corrective action as expeditiously as practicable. The permittee is also required to maintain records of the results of each fugitive emission inspection.

Both Permit Conditions 2.3 and 2.4 require the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes that taking corrective action within 24 hours of receiving a valid complaint or determining that fugitive PM emissions are not being reasonably controlled meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a delay may be necessary.

#### **4.5.2 Control of Odors - IDAPA 58.01.01.775-776, 5/1/1994**

##### **4.5.2.1 Requirement**

Permit Condition 2.5 and IDAPA 58.01.01.776 both state that: "*No person shall allow, suffer, cause or permit the emission of odorous gases, liquids or solids to the atmosphere in such quantities as to cause air pollution.*" By definition, this state rule (and any permit provision developed pursuant to this rule) is not an applicable requirement for Tier I operating permit purposes. They may be included in the Tier I operating permit, but must be clearly identified as state-only provisions. Provisions specifically identified as state-only are enforceable only in accordance with state law. State-only provisions are those that are not required under the federal Clean Air Act or under any of its applicable requirements or those provisions adopted by the state prior to federal approval. DEQ has elected to include the state-only permit provisions solely as an administrative action to consolidate all existing permit terms into one document, whether or not they are defined as applicable requirements for Tier I permitting purposes.

##### **4.5.2.2 Compliance Demonstration**

Permit Condition 2.6 requires the permittee to maintain records of all odor complaints received. If the complaint has merit, the permittee is required to take appropriate corrective action as expeditiously as

practicable. The records are required to contain the date that each complaint was received and a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

Permit Condition 2.6 requires the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes that taking corrective action within 24 hours of receiving a valid odor complaint meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

#### **4.5.3 Visible Emissions - IDAPA 58.01.01.625, 4/5/2000**

##### **4.5.3.1 Requirement**

IDAPA 58.01.01.625 and Permit Condition 2.7 states: "(No) person shall discharge any air pollutant to the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than twenty percent (20%) opacity as determined . . ." by IDAPA 58.01.01.625. This provision does not apply when the presence of uncombined water, NO<sub>x</sub>, and/or chlorine gas are the only reason(s) for the failure of the emission to comply with the requirements of this rule.

##### **4.5.3.2 Compliance Demonstration**

To ensure reasonable compliance with the visible emissions rule, Permit Condition 2.8 requires that the permittee conduct routine visible emissions inspections of the facility. The permittee is required to inspect potential sources of visible emissions, during daylight hours and under normal operating conditions. The visible emissions inspection consists of a see/no see evaluation for each potential source of visible emissions. If any visible emissions are present from any point of emission covered by this section, the permittee must either take appropriate corrective action as expeditiously as practicable, or perform a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625. A minimum of 30 observations shall be recorded when conducting the opacity test. If opacity is determined to be greater than 20% for a period or periods aggregating more than three minutes in any 60-minute period, the permittee must take corrective action and report the exceedance in its annual compliance certification and in accordance with the excess emissions rules in IDAPA 58.01.01.130-136. The permittee is also required to maintain records of the results of each visible emissions inspection and each opacity test when conducted. These records must include the date of each inspection, a description of the permittee's assessment of the conditions existing at the time visible emissions are present, any corrective action taken in response to the visible emissions, and the date corrective action was taken.

It should be noted that if a specific emission unit has a specific compliance demonstration method for visible emissions that differs from Permit Condition 2.8, then the specific compliance demonstration method overrides the requirement of condition 2.8. The Permit Condition 2.8 is intended for small sources that would generally not have any visible emissions.

Permit Condition 2.8 requires the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes that taking corrective action within 24 hours of discovering visible emissions meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a delay may be necessary.

#### **4.5.4 Excess Emissions-IDAPA58.01.01.130-136, 4/5/2000**

Permit Condition 2.9 requires that the permittee comply with the requirements of IDAPA 58.01.01.130-136 for startup, shutdown, scheduled maintenance, safety measures, upset, and breakdowns. Subsections 133.02, 133.03, 134.04, and 134.05 are not specifically included in the permit as applicable requirements. These provisions of the *Rules* only apply if the permittee anticipates requesting consideration under subsection 131.02 of the *Rules* to allow DEQ to determine if an enforcement action

to impose penalties is warranted. Section 131.01 states "... The owner or operator of a facility or emissions unit generating excess emissions shall comply with Sections 131, 132, 133.01, 134.01, 134.02, 134.03, 135, and 136, as applicable. If the owner or operator anticipates requesting consideration under Subsection 131.02, then the owner or operator shall also comply with the applicable provisions of Subsections 133.02, 133.03, 134.04, and 134.05." Failure to prepare or file procedures pursuant to Sections 133.02 and 134.04 is not a violation of the *Rules* in and of itself, as stated in subsections 133.03.a and 134.06.b. Therefore, since the permittee has the option whether or not to follow the procedures in subsections 133.02, 133.03, 134.04, and 134.05, the subsections are not considered applicable requirements for the purpose of this permit and are not included as such.

#### **4.5.5 Open Burning-IDAPA 58.01.01.600-616, 3/19/1999**

Permit Condition 2.10 requires compliance with open burning in accordance with IDAPA 58.01.01.600-616.

#### **4.5.6 Renovation/Demolition-40 CFR 61 subpart M**

Permit Condition 2.11 states: "Any renovation or demolition activity planned at the facility shall be conducted in accordance with 40 CFR 61.145. New materials to be used during any renovation at the facility shall comply with standards given in 40 CFR 61.146 for spray-on materials and 40 CFR 61.148 for insulating materials. Waste disposal for demolition, renovation, and spraying operations shall be conducted in accordance with 40 CFR 61.150 in prevention of visible emissions to the outside air of any asbestos-containing material. Air cleaning during demolition and renovation activities shall be conducted in accordance with 40 CFR 61.152. Any renovation or demolition activity planned at the facility shall comply with 40 CFR 61.153 for reporting requirements to EPA."

The condition summarizes the requirements of standards given in 40 CFR 61, Subpart M that apply to renovation and demolition activities, and the concomitant activities that occur during renovation or demolition. This regulation is intended to prevent visible emissions of asbestos during the renovation or demolition of a facility or part of a facility, and during the operation of asbestos disposal sites.

#### **4.5.7 Chemical Accident Prevention Provisions-40 CFR 68.10(A)**

The facility certified in the permit application that it does not have sources that are at threshold levels of any specified chemicals as determined in accordance with 40 CFR 68.115. Therefore, the facility is currently not subject to the requirements of 40 CFR 68. However, should the facility ever become subject to 40 CFR 68, it must comply with the requirements of the chemical accident prevention provisions at 40 CFR 68 no later than the latest of the following dates:

- Three years after the date on which a regulated substance present above a threshold quantity is first listed under 40 CFR 68.130.
- The date on which a regulated substance is first present above a threshold quantity in a process.

#### **4.5.8 Fuel Burning Equipment - Particulate Matter-IDAPA 58.01.01.675, 4/5/2000**

Permit Condition 2.13 requires that: "The permittee shall not discharge to the atmosphere from any fuel-burning equipment particulate matter in excess of 0.015 gr/dscf of effluent gas corrected to 3% O<sub>2</sub> by volume for gas." Per the application, the boilers at this facility are fired by natural gas only.

#### **4.5.9 Fuel-Sulfur Content-IDAPA 58.01.01.728, 5/1/1994**

##### **4.5.9.1 Requirement**

Permit Condition 2.14 gives the allowable sulfur content of fuels in accordance with IDAPA 58.01.01.728.

#### **4.5.9.2 Monitoring, Recordkeeping, and Reporting**

Permit Condition 2.15 requires the permittee maintain documentation on an annual basis from all fuel suppliers, that fuel supplied complies with applicable fuel sulfur content limits.

#### **4.5.10 Recycling and Emission Reductions-40 CFR 82 Subpart F**

The standards in 40 CFR 82, Subpart F are intended to reduce emissions of Class I and Class II refrigerants to the lowest achievable level during the service, maintenance, repair, and disposal of appliances. Equipment at MTI contains and uses Class I or Class II substances as a refrigerant. Work practice standards, recycling and recovery equipment standards, and certification requirements are applicable to appliance operations at MTI. Records required by this subpart must be kept on site for a minimum of three years.

#### **4.5.11 Reports and Certifications-IDAPA 58.01.01.322.08, .11, 5/1/1994**

Permit Condition 2.17 gives the addresses for all reports, certification, and notifications required in the Tier I operating permit.

#### **4.5.12 Monitoring and Recordkeeping-IDAPA 58.01.01.322.07, 5/1/1994**

Permit Condition 2.18 summarizes the monitoring and recordkeeping requirements necessary to demonstrate compliance with the Tier I operating permit.

#### **4.5.13 Test Methods and Procedures-IDAPA 58.01.01.157 4/5/2000**

Permit Condition 2.19 delineates the test methods if testing is required. All testing shall be conducted in accordance with the procedures in IDAPA 58.01.01.157.

#### **4.5.14 Compliance Testing-IDAPA 58.01.01.157, 4/5/2000 and 322.06, 08a, 09, 5/1/1994**

Permit Condition 2.20 gives the requirements for compliance testing.

#### **4.5.15 Semiconductor Manufacturing-40 CFR 60 Subpart BBBBB**

40 CFR 60 Subpart BBBBB applies to semiconductor manufacturers that are major sources of hazardous air pollutants. The applicable requirements become effective upon proposal in the Federal Register.

### **5. REGULATORY AND ENGINEERING ANALYSIS - EMISSIONS UNITS**

#### **5.1 EU-1 - NATURAL GAS BOILERS**

##### **5.1.1 Emissions Unit Description**

Emissions unit group one (EU1) consists of boilers that by design can only be fired by natural gas.

Heat is supplied to the MTI facility via the operation of natural gas-fired boilers (boilers) that generate steam. The steam is also used for humidifying the fabrication areas. A supply of continuous steam is provided for fluctuating demand through a boiler staging process. Boiler steam exhaust lines are manifolded to a header with a pressure sensor mounted inside. Boilers are fired or shut down to maintain a specified steam pressure at the header. Steam demand will dictate which boilers are fired and in what sequence. The boilers are wired in a series configuration with the lower capacity units operating at low steam demand and the higher capacity units operating at high steam demand. No steam is used for process purposes or comes in contact with any processes.

All boilers are fired by natural gas only. Changing the fuel used by these boilers will be considered a modification. The permit requirements only cover an NSPS-affected facility with boilers fired by natural gas only. The phrase "NSPS-affected natural gas boiler" is defined as a natural gas boiler, designed to fire natural gas only, which meets the applicability requirements in 40 CFR 60.40c(a).

The overall heat input of boilers exceeds 250 MMBtu/hr. Therefore, the boilers, as a support operation, are a designated facility in accordance with IDAPA 58.01.01.006.27.v. The PTE from these boilers is 94.91 T/yr for CO and 94.25 T/yr for NO<sub>x</sub> as provided by the applicant. There is no air pollution control equipment used on the boilers. Installation of any new unit will require new source review according to IDAPA 58.01.01.200.

Table 5.1 summarizes the design capacity, fuel usage, installation date, and NSPS applicability of each boiler. Each of the boilers listed in the table is designed for low emissions of NO<sub>x</sub>. Boilers 0407 and 2506 through 2509 are newer boilers and are designed to attain even lower emissions than the other boilers.

**Table 5.1 EU1-Natural Gas Boilers**

Boiler	Capacity (MMBtu/hr)	Fuel Use (10 <sup>3</sup> ft <sup>3</sup> /day)	Date Installed/Last Modified	Subject to NSPS Subpart Dc (Y/N)
EU1-0401	12.56	2870	7/1/84	N
EU1-0402	12.56	2870	7/1/84	N
EU1-0403	25.11	5739	7/1/84	N
EU1-0404	25.11	5739	4/29/88	N
EU1-0405	29.30	6696	11/10/88	N
EU1-0406	29.30	6696	8/10/90	Y
EU1-2502	12.56	2870	12/14/93	Y
EU1-2503	12.56	2870	12/14/93	Y
EU1-2504	25.11	5738	12/20/93	Y
EU1-3201	1.125	2570	5/3/94	N
EU1-2501	25.11	5738	8/1/94	Y
EU1-2505	25.11	5738	1/26/95	Y
EU1-0407	25.11	5738	8/14/95	Y
EU1-2506	25.11	5738	11/1/95	Y
EU1-2507	25.11	5738	11/1/95	Y
EU1-2508	25.11	5738	4/21/97	Y
EU1-2509	25.11	5738	4/21/97	Y

## **5.1.2 Permit Requirement - Visible Emissions - IDAPA 58.01.01.625, 4/5/2000**

### **5.1.2.1 Applicable Requirement**

Visible emissions from the natural gas boilers shall be regulated according to Permit Condition 2.7, which states: "No person shall discharge any air pollutant to the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than 20% opacity as determined by procedures contained in IDAPA 58.01.01.625. These provisions shall not apply when the presence of uncombined water, nitrogen oxides, and/or chlorine gas are the only reason(s) for the failure of the emission to comply with the requirements of this section."

### **5.1.2.2 Monitoring, Recordkeeping, and Reporting - IDAPA 58.01.01.322.06, 07, 5/1/94; IDAPA 58.01.01.322.08, 4/5/00**

Permit Condition 2.8 states: "The permittee shall conduct a quarterly facility-wide inspection of potential sources of visible emissions, during daylight hours and under normal operating conditions. The visible emissions inspection shall consist of a see/no see evaluation for each potential source of visible emissions. If any visible emissions are present from any point of emission, the permittee shall either take appropriate corrective action as expeditiously as practicable, or perform a Method 9 opacity test in

accordance with the procedures outlined in IDAPA 58.01.01.625. A minimum of 30 observations shall be recorded when conducting the opacity test. If opacity is greater than 20% for a period or periods aggregating more than three minutes in any 60-minute period, the permittee shall take all necessary corrective action and report the exceedance in its annual compliance certification and in accordance with IDAPA 58.01.01.130-136. The permittee shall maintain records of the results of each quarterly visible emission inspection and each opacity test when conducted. The records shall include, at a minimum, the date and results of each inspection and test and a description of the following: the permittee's assessment of the conditions existing at the time visible emissions are present (if observed), any corrective action taken in response to the visible emissions, and the date corrective action was taken."

### **5.1.3 Permit Requirement - Fuel Burning Equipment - Particulate Matter - IDAPA 58.01.01.675, 4/5/2000**

The standard for PM emissions from the natural gas boilers is regulated under the facility-wide provisions for fuel burning equipment. Permit Condition 2.13 states: "The permittee shall not discharge to the atmosphere from any fuel-burning equipment particulate matter in excess of 0.015 gr/dscf of effluent gas corrected to 3% O<sub>2</sub> by volume for gas."

### **5.1.4 Permit Requirement - Fuel - Natural Gas - IDAPA 58.01.01.322.01 (3/19/1999); and Record and maintain records of fuel usage and fuel type each day - 40 CFR 60.40c(a), 40 CFR 48c (g) &(l); and IDAPA 58.01.01.322.01 (3/19/1999), .06(5/1/1994), & .07(5/1/1994)**

Permit Condition 3.1 states: "Compliance with IDAPA 58.01.01.675 is assured by burning natural gas in the boilers." Permit Condition 3.2 states: "The permittee shall record and maintain records of the amounts of fuel used during each day in each NSPS-affected natural gas-fired boiler." 'NSPS-affected natural gas-fired boiler' in this section means each natural gas-fired boiler, designed to fire natural gas only, which meets the applicability requirements in 40 CFR 60.40c(a)."

The following calculation demonstrates that Permit Conditions 3.1 and 3.2 are sufficient to assure compliance with the PM standard for fuel burning equipment provided that only natural gas is combusted. According to AP-42, Section 1.4, approximately 7.6 lb/10<sup>6</sup>scf of PM is generated during natural gas combustion in 10 - 100 MMBtu/hr boilers. Also, according to 40 CFR 60, Appendix A, Method 19, approximately 8710 dscf of flue gas at standard conditions (68°F, 29.92 in Hg) is created per million Btu of natural gas. This data is used in the following steps to demonstrate that particulate emissions from the combustion of natural gas will always be less than the particulate matter standard of 0.015 gr/dscf.

#### **1) Correct the flue gas volume -**

For an altitude of 3066 feet (per IDAPA 58.01.01.680), subtract 0.10 x 30.66 = 3.066 in. Hg from standard atmospheric pressure at sea level:

$$29.92 \text{ in Hg} - 3.066 \text{ in Hg} = 26.85 \text{ in Hg}$$

Using the Ideal Gas Law,

$$V_2 = \frac{P_1 V_1}{P_2} \quad (5.1)$$

where,

V<sub>2</sub> = the gas volume corrected for altitude,

V<sub>1</sub> = the known gas volume (8710 dscf),

P<sub>1</sub> = the pressure of the known gas volume (29.92 in Hg),

P<sub>2</sub> = the pressure of the corrected gas volume (26.85 in Hg).



The altitude corrected volume ( $V_2$ ) of the flue gas is 9,705 dscf.

For 3% oxygen, using a standard correction ratio as presented in 40 CFR 60, Appendix A, Method 19:

$$F_2 = F_1(20.9/(20.9 - 3.0)) \quad (5.2)$$

where,

$F_2$  = the gas volume corrected to 3% oxygen,

$F_1$  = the altitude corrected flue gas volume (9,705 dscf) as calculated in Equation (5.1).

The oxygen and altitude corrected volume ( $F_2$ ) of the flue gas is 11,332 dscf/10<sup>6</sup> Btu of natural gas.

2) Determine the volume of flue gas created by the combustion of one million cubic feet of natural gas:

$$10^6 \text{ ft}^3 \times 1,050 \text{ Btu/ft}^3 \times 11,332 \text{ dscf/10}^6 \text{ Btu} = 11.9 \times 10^6 \text{ dscf} \quad (5.3)$$

Determine the grain loading per cubic foot of flue gas:

$$(7.6 \text{ lb PM})(7,000 \text{ gr/lb})(1/11.9 \times 10^6 \text{ dscf}) = 0.004 \text{ gr/dscf} < 0.015 \text{ gr/dscf} \quad (5.4)$$

Emission factors given in AP-42 are generally accepted as conservative estimates. Even a conservative estimate of emissions from natural gas combustion results in an approximated grain loading well below the standard of 0.015 gr/dscf. Therefore, as long as the permittee uses only natural gas as fuel in the natural gas-fired boilers, compliance with the particulate matter standard for fuel-burning equipment shall be attained.

#### **5.1.5 Permit Requirement - Notification - 40 CFR 60.7(a)(1)&(3); 40 CFR 60.48c(a)(1)&(3)**

NSPS-affected natural gas boiler notification requirements have been fulfilled for existing emissions units.

#### **5.1.6 Permit Requirement - Submitting Materials - 40 CFR 60.4(a)&(b); 40 CFR 60.7(a)(1)&(3); 40 CFR 60.48c(a)(1)&(3); IDAPA 58.01.01.322.01, 3/19/1999**

Permit Condition 3.3 provides addresses for submittal of all requests, reports, applications, submittals, and other communications, including notification of reconstruction and the startup date. This is required under 40 CFR 60 Subpart A - General Provisions.

#### **5.1.7 Permit Requirement - Startup, Shutdown, and Malfunction - 40 CFR 60.7(b); IDAPA 58.01.01.322.07, 5/1/1994**

Permit Condition 3.4 requires recordkeeping for the occurrence and duration of any startup, shutdown, or malfunction during operation of each NSPS-affected boiler. This summarizes requirements given in 40 CFR 60 Subpart A - General Provisions.

### **5.2 EU4--MANUFACTURING PROCESSES**

#### **5.2.1 Emissions Unit Description**

Emissions unit group 4 (EU4) encompasses all processing, manufacturing, and waste handling at MTI. Control devices are installed for the manufacturing processes. One type of control device is a Munter Zeol concentrator/oxidation system, also called a VOC abatement unit. The VOC emission sources are mainly coat tracks in the photolithography process and select wet-etch processes. The other type of

control device is a wet scrubber used to control acids, bases, and water-soluble material constituents from HAP emission sources. The HAP emission sources are mainly the process cleaning steps and the etch steps. Per MTI's Tier I Operating Permit Supplement II application, dated May 10, 1999, there are five VOC abatement units and 33 wet scrubbers at MTI's Boise facility.

The VOC abatement units are operated to limit PTE of VOCs for the facility. The VOC abatement units are regulated in an amended consent order issued to MTI on September 14, 1998. The October 28, 1999 memorandum from Lisa Kronberg to Yihong Chen describes the intent and interpretation of the consent order. The terms in the amended consent order are incorporated into the Tier I operating permit for manufacturing processes controlled by VOC abatement units. The MTI facility requested that requirements for the wet scrubbers be included in the Tier I operating permit to limit the PTE for HAPs. However, there are no existing permit conditions or consent order conditions for the wet scrubbers. The facility shall submit an application for a facility-wide Tier II operating permit in order to establish enforceable limitations for emissions controlled by wet scrubbers.

Emissions of VOCs from manufacturing processes are estimated based on a mass balance method. According to the applicant's certification, the basic concept of this mass balance method is illustrated in Equation 1 below.

Emissions = [Constituents used in process - constituents in liquid waste streams]uncontrolled + [(Constituents used in process - constituents in liquid waste streams)controlled x (1 - control efficiency/100)]

The PTE of VOCs varies with the fluctuating control efficiency with the operational status of the VOC abatement unit. For example 0% control efficiency will be used when the VOC abatement unit is down or operated out of the conditions set in the permit or manufacturer's operational conditions. The change in PTE may cause a change in a PTC applicability determination.

#### **5.2.2 Permit Requirement - Definition of Certain Terms - Third Amended Consent Order, 10/7/02**

Permit Condition 4.1 provides definitions of coat track, coat bake, facility, and VOC abatement unit as quoted from Third Amended Consent Order, 10/7/02.

#### **5.2.3 Permit Requirement - Operate VOC Abatement Units - IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.2 states: "MTI shall operate VOC abatement units to control emissions from coat tracks thereby limiting the facility's potential to emit VOCs". The requirement is a quote of Third Amended Consent Order, 10/7/02.

Compliance is demonstrated by:

- Permit Condition 4.6 requiring continuous monitoring of the operating parameters; and
- Permit Condition 4.7 requiring a log of downtime per VOC abatement unit.

#### **5.2.4 Permit Requirement - Connect all Coat Tracks Installed to a VOC Abatement Unit - IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.3 states: "MTI shall connect all coat tracks installed at the facility to a VOC abatement unit". This requirement is a quote of Third Amended Consent Order, 10/7/02.

Compliance is demonstrated by:

- Permit Condition 4.6 requiring continuous monitoring of the operating parameters;
- Permit Condition 4.7 requiring a log of downtime per VOC abatement unit;
- Permit Condition 4.8 for conducting applicability determinations with control efficiency for each VOC abatement unit calculated once per month; and

- Permit Condition 4.9 requiring a summary report of all applicability determinations involving VOC emissions.

The operating, monitoring, recordkeeping, and reporting requirements provide information on preconstruction applicability determination for installing new coat tracks. Also, these requirements provide information on reconfiguring a VOC abatement unit. All the required information allows DEQ to track whether or not all coat tracks installed are connected to a VOC abatement unit. The source of VOC emissions must be connected to a VOC abatement unit and must remain connected or the preconstruction determination would have to be revised.

**5.2.5 Permit Requirement - Properly Operate and Maintain - IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.4 states: *"MTI shall, at all times, properly operate and maintain the VOC abatement units. Proper operation and maintenance includes downtime for repairs and maintenance"*. This requirement is a quote of the Third Amended Consent Order, 10/7/02.

Compliance is demonstrated by:

- Permit Condition 4.6 requiring continuous monitoring of the operating parameters; and
- Permit Condition 4.7 requiring a log of downtime per VOC abatement unit.

**5.2.6 Permit Requirement - Temperatures of VOC Abatement Units - IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.5.1 states: *"Oxidation temperature shall be 1,350 degrees F or greater"* and Permit Condition 4.5.2 states: *"Desorption temperature shall be 340 degrees F or greater"*. These requirements are quoted from the Third Amended Consent Order, 10/7/02.

Compliance is demonstrated by:

- Permit Condition 4.6 requiring continuous monitoring of the operating parameters; and
- Permit Condition 4.7 requiring records of downtime per VOC abatement unit.

**5.2.7 Permit Requirement - Inlet Gas Flowrate of VOC Abatement Units - IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.5.3 states: *"Each unit shall not be operated outside of the manufacturer's design capacity, 1,500 to 6,700 acfm for D-1500 units or equivalent, 2,000 to 15,000 acfm for S-2400 units or equivalent, or 5,000 to 30,000 acfm for D-3500 units or equivalent as applicable"*. This is a direct quote of Third Amended Consent Order, 10/7/02. The detailed flowrate ranges for the existing models were provided by MTI. In addition to units D-1500 and S-2400 regulated in the amended consent order dated 9/14/1998, MTI added the unit listed as D-3500 with the design capacity range of 5,000 acfm to 30,000 acfm. Installing or replacing a VOC abatement unit with different operating ranges than those in the amended consent order is allowed as long as appropriate operating conditions are developed in accordance with manufacturer's recommendations.

Compliance is demonstrated by:

- Permit Condition 4.6 requiring continuous monitoring of the operating parameters; and
- Permit Condition 4.7 requiring a log of downtime per VOC abatement unit.

Currently there is no flowmeter on line to continuously measure the inlet flowrate to VOC abatement units. To comply with Permit Condition 4.5.3, a manual measurement for each VOC abatement unit is required. The flowrate range for each model is relatively wide. MTI proposes to measure and record

flowrates monthly. A draft fan is used in each VOC abatement unit. Connecting a new tool to the unit may change the flowrate. When too many tools are connected to the unit, the flowrate may fall out from the range set in the permit and 0% control efficiency must be used.

A reconfiguration of a VOC abatement unit may change the inlet flowrate of VOC abatement units. Reconfiguration means to move one or more VOC abatement units from one physical location to another. A measurement is required whenever that happens.

**5.2.8 Permit Requirement - Continuously Monitor- IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.6 states: "MTI shall continuously monitor the parameters set forth in Permit Conditions 4.5.1 and 4.5.2. Once per month, MTI shall record the parameters set forth in Permit Conditions 4.5.1, 4.5.2, and 4.5.3. This information shall be made available to the Department upon request". This requirement is taken from Third Amended Consent Order, 10/7/02. For consistency in numbering, the terms "Permit Conditions 4.5.1 and 4.5.2" and "Permit Conditions 4.5.1, 4.5.2, and 4.5.3" replace the original terms of the Third amended consent order "paragraphs 8.a and b" and "paragraphs 8.a, b, and c".

**5.2.9 Permit Requirement - Log of Downtime- IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.7 states: "MTI shall keep records of downtime per VOC abatement unit, which shall be made available to the Department upon request". This is from Third Amended Consent Order, 10/7/02. The amended consent order term 'log' of downtime was changed in the Tier I operating permit to 'record' of downtime so as not to imply that any compilation of records must of necessity be in one logbook.

**5.2.10 Permit Requirement - Applicability Determinations- IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.8 states: "In conducting applicability determinations under IDAPA 58.01.01.200-223, MTI may take into account the controls required by this operating permit in calculating potential to emit. Once per month, MTI shall determine and record, based on the parameters outlined in Permit Condition 4.5, the control efficiency for each VOC abatement unit". The requirement is taken from the Third Amended Consent Order, 10/7/02. Two changes to update the terms in the Third amended consent order include changing "this Order" to "this operating permit" and "section 8" to "Permit Condition 4.5". The original intent of the Third amended consent order remains exactly the same.

A change in control efficiency, which will change the PTE of a source, can be triggered by:

- reconfiguration of a control device;
- change of chemicals that go through a control device;
- different operational conditions of a control device;
- different duration of downtime; and/or
- similar activities.

Therefore, it is necessary to record all the information that will cause any change of PTE applicability determinations under Permit Condition 4.8. All the information used to calculate PTE and then used to do an applicability determination shall be recorded.

Currently, the manufacturer guarantees VOC emissions control for all VOC abatement units. For each VOC abatement unit, MTI sends operating conditions to the manufacturer to obtain the control efficiency for that unit. With this manufacturer guarantee, no source test is required to verify control efficiency.

**5.2.11 Permit Requirement - Summary Report of all Applicability Determinations- IDAPA 58.01.01.322.01, 3/19/1999; Third Amended Consent Order, 10/7/02**

Permit Condition 4.9 states: "Every six months, MTI shall submit to the Department a summary report of all applicability determinations conducted by MTI under IDAPA 58.01.01.200-223 involving VOC emissions after the date of this operating permit, including status of construction. All supporting documentation shall be made available to the Department upon request". The requirement is taken from the Third Amended Consent Order, 10/7/02. In the Tier I operating permit "this Order" is changed to "this operating permit". The original requirement of the amended consent order to submit reports in "May and November" was changed at the request of MTI to "every six months" in order be consistent with the reporting time in General Provision 24 without changing the reporting frequency. The original intent of the amended consent order remains exactly the same.

**5.2.12 Permit Requirement - Submit Tier II Operating Permit Application- IDAPA 58.01.01.322.01, 3/19/99; Third Amended Consent Order, 10/7/02**

Permit Condition 4.10 states: " MTI shall submit a facility-wide Tier II operating permit application within 180 days of the effective date of this Third Amended Consent Order. The application shall comply with IDAPA 58.01.01.402, and include all application information required by IDAPA 58.01.01.202." The requirement is a direct quote of the Third Amended Consent Order, 10/7/02. A Tier II operating permit will allow the facility to consider the wet scrubbers in calculating potential to emit. The Tier II operating permit shall establish specific emission standards, or shall establish requirements on operation or maintenance that are necessary to ensure compliance with any applicable emission standard or rule.

**5.3 EU-3 - TANKS**

The recording requirement is established in accordance with 40 CFR 60, Subpart KB for performance standards for volatile organic liquid storage vessels (including petroleum liquid storage vessels) for which construction, reconstruction, or modification commenced after July 23, 1984. According to MTI's Tier I Operating Permit Supplement II application, dated May 10, 1999, tanks storing volatile organic liquids at MTI are limited to:

- one 500-gallon (1.9m<sup>3</sup>) gasoline tank;
- one 1,000-gallon (3.8m<sup>3</sup>) diesel tank;
- one 10,000-gallon (37.9m<sup>3</sup>) hazardous waste storage tank; and
- one 12,000-gallon (45.4m<sup>3</sup>) hazardous waste storage tank.

The requirement in 40 CFR 60.116b(b) indicates that the owner or operator of each storage vessel as specified in 40 CFR 60.110b(a) shall keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel. The records shall be kept readily accessible for the life of the source. This requirement applies to each storage vessel with a design capacity greater than 40m<sup>3</sup> and less than 75m<sup>3</sup>. Therefore, the requirement is applicable only to the 12,000-gallon hazardous waste storage tank at this time. Any addition of volatile organic liquid storage vessels within the designated size range shall come under the purview of this applicable requirement.

**5.4 NON-APPLICABILITY DETERMINATIONS**

***Process Weight Rate***

Process weight rate is not applicable to the manufacturing processes at MTI.

***Lime and Sodium Carbonate Storage Silos***

The construction of an industrial wastewater treatment plant required the use of hydrated lime as a reagent as well as the use of sodium carbonate. This resulted in the construction and installation of a lime storage silo and a sodium carbonate storage silo, which are sources of air pollution.

Based on an ambient air quality analysis conducted by DEQ in 1991, the annual emissions from these two units are less than 1 T/Yr. Without baghouses, the emissions cause an unacceptable ambient impact. However, the impact of emissions with baghouses is well within the 5 :g/m<sup>3</sup>, 24-hour concentration impact limitation for particulate matter in nonattainment areas.

**6. ALTERNATIVE OPERATING SCENARIOS**

No alternative operating scenarios have been requested by MTI.

**7. TRADING SCENARIOS**

The permittee has not requested to trade any emissions.

**8. COMPLIANCE CERTIFICATION**

MTI certified compliance with all applicable requirements. No compliance plan was submitted.

**8.1 Compliance Certification**

MTI is required to periodically certify compliance in accordance with General Permit Provision 21.

**9. ACID RAIN PERMIT**

Emissions units within MTI facility boundaries are classified as Small Industrial/ Commercial/Institutional steam generating units and are subject to the provisions and restrictions identified in 40 CFR 60, Subpart Dc.

In accordance with 40 CFR 72.6(b)(8), non-utility units are not subject to the requirements of the Acid Rain Program. This citation specifically exempts any non-utility combustion units. The boilers at MTI fall under this exemption.

## 10. AIRS DATABASE

### AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

AIR PROGRAM	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
POLLUTANT							
SO <sub>2</sub>	B					B	U
NO <sub>x</sub>	A					A	U
CO	A					A	N
PM <sub>10</sub>	B					B	U
PT (Particulate)	B					B	
Ozone <i>100% VOC</i>	B		B			B	U
THAP (Total HAPs)	B					B	
			APPLICABLE SUBPART				
			KB				

#### AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

## 11. REGISTRATION FEES

This facility is a major facility as defined by IDAPA 58.01.01.008.10; therefore, registration and registration fees in accordance with IDAPA 58.01.01.387 apply.

## 12. RECOMMENDATION

Based on review of MTI's Tier I operating permit application materials, and state and federal rules and regulations, staff recommends that DEQ issue final Tier I operating permit No. 001-00044 to MTI for their facility in Boise.

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cc: Mike McGown, Boise Regional Office  
Laurie Kral, EPA Region 10  
Sherry Davis, Air Quality Division

***APPENDIX***  
***Response to Public Comments***



November 14, 2002

**STATE OF IDAHO  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
RESPONSE TO PUBLIC COMMENTS  
ON DRAFT AIR QUALITY TIER I OPERATING PERMIT  
FOR MICRON TECHNOLOGY INC., BOISE, IDAHO**

**Introduction**

As required by IDAPA 58.01.01.364, *Rules for the Control of Air Pollution in Idaho (Rules)*, the Idaho Department of Environmental Quality (Department) provided an opportunity for public notice and comment, including a public hearing, on the draft Tier I operating permit for the Micron Technology Inc. (MTI) facility in Boise. Public comment packages, which included the application materials, draft permit, and technical memorandum, were made available for public review at the Boise Public Library, the Department's Boise Regional Office, and the Department's State Office in Boise. A copy of the draft permit and technical memorandum was also posted on the Department's Web site. The public comment period was provided from October 12 through November 12, 2002. A public hearing was held in the Department's State Office building on November 12, 2002. The only entity to provide comments on the draft permit and technical memorandum was MTI. Those comments regarding the air quality aspects of the permits are provided below with the Department's response immediately following.

**Public Comments and Department Responses**

**Comment 1:**

The following Draft Permit terms should be deleted: [Permit Condition] 2.3, entire second sentence; [Permit Condition] 2.4, entire second sentence; [Permit Condition] 2.6, entire second sentence; and [Permit Condition] 2.8, the following part of the third sentence, *"either take appropriate corrective action as expeditiously as practicable or"*. MTI asserts this requirement constitutes a new applicable requirement, which is not allowed by Idaho's Tier I operating permit regulations.

**Response to 1:**

To aid in the Department's response, the permit conditions referenced in MTI's comment are provided below with emphasis added to that part of the requirement in question.

2.3 The permittee shall maintain records of all fugitive dust complaints received. *The permittee shall take appropriate corrective action as expeditiously as practicable after receipt of a valid complaint.* The records shall include, at a minimum, the date each complaint was received and a description of the following: the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

**[IDAPA 58.01.01.322.06, 07, 5/1/94]**

2.4 The permittee shall conduct a quarterly facility-wide inspection of potential sources of fugitive emissions, during daylight hours and under normal operating conditions, to ensure that the methods used to reasonably control fugitive emissions are effective. *If fugitive emissions are not being reasonably controlled, the permittee shall take corrective action as expeditiously as practicable.* The permittee shall maintain records of the results of each quarterly fugitive emission inspection. The records shall include, at a minimum, the date of each inspection and a description of the following: the permittee's assessment of the conditions existing at the time fugitive emissions were present (if observed), any corrective action taken in response to the fugitive emissions, and the date the corrective action was taken.

**[IDAPA 58.01.01.322.06, 07, 5/1/94; IDAPA 58.01.01.322.08, 4/5/00]**

- 2.6 The permittee shall maintain records of all public odor complaints received. *If the complaint has merit, the permittee shall take appropriate corrective action as expeditiously as practicable.* The records shall include, at a minimum, the date each complaint was received and a description of the following: the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.  
[IDAPA 58.01.01.322.06, 07 (state-only), 5/1/94]
- 2.8 The permittee shall conduct a quarterly facility-wide inspection of potential sources of visible emissions during daylight hours and under normal operating conditions. The visible emissions inspection shall consist of a see/no see evaluation for each potential source. If any visible emissions are present from any point of emission, the permittee shall *either take appropriate corrective action as expeditiously as practicable, or* perform a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625. Should a Method 9 opacity test be required under this permit condition, the 15-day notice of intent, pursuant to Permit Condition 2.20, does not apply. A minimum of 30 observations shall be recorded when conducting the opacity test. If opacity is greater than 20% for a period or periods aggregating more than three minutes in any 60-minute period, the permittee shall take all necessary corrective action and report the exceedance in its annual compliance certification, and in accordance with IDAPA 58.01.01.130-136. The permittee shall maintain records of the results of each quarterly visible emission inspection and each opacity test when conducted. The records shall include, at a minimum, the date and results of each inspection and test and a description of the following: the permittee's assessment of the conditions existing at the time visible emissions are present (if observed), any corrective action taken in response to the visible emissions, and the date corrective action was taken.  
[IDAPA 58.01.01.322.06, 07, 5/1/94; IDAPA 58.01.01.322.08, 4/5/00]

The regulatory basis, as cited in the draft permit, is IDAPA 58.01.01.322.06, 07, and 08, which requires that all Tier I permits contain sufficient monitoring, recordkeeping, and reporting to ensure compliance with all the terms and conditions of the Tier I permit. If the applicable requirement does not contain such provisions, appropriate provisions must be added in the Tier I permit (known as "gap filling").

Corrective action is not an additional permit condition, rather it is a reasonable and appropriate provision upon which compliance with the applicable requirement can be reasonably assured. Failure to take corrective action is not a violation in and of itself. If fugitive emissions, odors, or visible emissions were not being reasonably controlled, the violation would not be for failure to take corrective action, but rather for not reasonably controlling these emissions.

**Comment 2:**

**Permit Condition 3.1, delete the first sentence. MTI asserts that there is no regulatory authority to require that only natural gas fuel be used in the boilers.**

**Response to 2:**

To aid in the Departments response, Permit Condition 3.1, as stated in the draft permit, is provided below.

- 3.1 The permittee shall use only natural gas fuel in the boilers. Compliance with IDAPA 58.01.01.675 is assured by burning natural gas in the boilers.  
[IDAPA 58.01.01.322.01, 3/19/99]

The Department concurs with MTI. All of the boilers currently operating at MTI's facility are natural gas-fired by design. The Department does not have the regulatory authority to require

the exclusive use of natural gas. The requirements that apply to the boilers are IDAPA 58.01.01.625 (visible emissions), 675 (grain loading), and 40 CFR 60, Subpart Dc for any affected stationary source. Compliance with IDAPA 58.01.01.625 and 675 is by burning natural gas in the boilers. For each affected stationary source, compliance with 40 CFR 60, Subpart Dc is the following: record and maintain records of the fuel usage each day; recordkeeping and reporting notification of construction, reconstruction, and startup; and recordkeeping of startup, shutdown or malfunction.

**Comment 3:** Table 4.1, Permit Condition 4.11. Delete the entire provision. There is no Permit Condition 4.11 or a proposed applicable requirement to "submit supplemental PTC applications deemed necessary."

**Response to 3:** The Department concurs with MTI. Inclusion of Permit Condition 4.11 was an oversight by the Department and should not have been listed in Table 4.1 of the draft permit. This permit condition has been deleted.

**Comment 4:** Section 4.5.1.2, 4.5.2.2, 4.5.3.2, 5.1.2.2, and 5.1.4 of the Technical Basis should be conformed to reflect these changes to the Draft Permit.

**Response to 4:** Section 4.5.1.2, 4.5.2.2, 4.5.3.2, and 5.1.2.2 all relate to corrective action as explained in Response to Comment No. 1. Because the permit is not being revised in response to Comment No. 1 for the reasons indicated, the Technical Basis is also not being revised.

Section 5.1.4 relates to the fuel-burning equipment grain-loading standard (IDAPA 58.01.01.675). The requirement that only natural gas is to be burned in the boilers has been deleted. As explained in Response to Comment No. 2 the Department does not have the regulatory authority to require the exclusive use of natural gas.

#### **Draft Permit Comments**

**Comment 5:** **Table 2.1**

- **Permit Condition 2.13:** For consistency with the rest of the Draft Permit, the legal cite should be changed to IDAPA 58.01.01.675-677.
- **Permit Condition 2.14:** The Monitoring and Recordkeeping Requirements should include [Permit Condition] 2.15.
- **Permit Condition 2.16:** The legal cite should be, "40 CFR 82, Subpart F."

**Response to 5:** Table 2.1 has been revised as requested in Comment No. 5.

**Comment 6:** **Narrative Section**  
**[Permit Conditions] 2.11 and 2.12:** These conditions don't currently apply but may in the future.

**Response to 6:** Because these permit conditions may apply in the future, they remain in the permit.

**Comment 7:** **Table 3.1**  
**Permit Condition 2.13:** The Monitoring and Recordkeeping Requirements should include [Permit Condition] 3.2. [Permit Condition] 2.13 should be deleted because it is not a monitoring or recordkeeping requirement.

**Response to 7:** Table 3.1 has been revised as requested in Comment No. 7.

**Comment 8:**

**Narrative Section**

[Permit Condition] 3.3. In the first bullet, the words “combusted” and “identification” are misspelled.

**Response to 8:**

Permit Condition 3.3 has been corrected.

**Comment 9:**

**Table 4.1**

- **Permit Condition 4.1:** The cite to IDAPA 58.01.01.322.01 is incorrect and should be deleted in both the table and Section 4.1 of the draft permit.
- **Permit Condition 4.10:** The cite to IDAPA 58.01.01.322.01 is incorrect and should be deleted in both the table and Section 4.10 of the draft permit.
- **Permit Condition 4.11:** Delete the entire provision. There is no permit condition 4.11 or a proposed applicable requirement to “submit supplemental PTC applications deemed necessary.”

**Response to 9:**

Permit Condition 4.1. The regulatory authority is the Third Amended Consent Order; therefore, the IDAPA 58.01.01.322.01 citation has been deleted.

Permit Condition 4.10. The regulatory authority is the Third Amended Consent Order; therefore, the IDAPA 58.01.01.322.01 citation has been deleted.

Permit Condition 4.11. Refer to Response to Comment No. 3.

**Comment 10:**

**Narrative Section**

- **[Permit Conditions] Sections 4.3, 4.5.2, and 4.8** have an incorrect date on the legal cite for 322.01.
- **[Permit Condition] 4.5.3.** The flow rate requirement for VOC abatement units D-1500 or equivalent was cited incorrectly. The Third Amended Consent Order dated October 7, 2002, reads 1500-6700 acfm.
- **[Permit Condition] 4.9.** This section of the Draft Permit should be written to reflect Section 5.2.1.1 of the Technical Basis. The words “Every six months” should replace “Each May and November” in the first sentence.

**Response to 10:**

The effective date for IDAPA 58.01.01.322.01 in Permit Conditions 4.3, 4.5.2, and 4.8 was incorrectly written as 3/19/19. The correct effective date is 3/19/99. Permit Conditions 4.3, 4.5.2, and 4.8 have been revised to reflect the correct date.

Permit Condition 4.5.3. The flow rate to VOC abatement units D-1500 or equivalent has been revised to read 1,500 to 6,700 acfm as requested.

Permit Condition 4.9. Has been changed to read “Every six months, . . .”

**Technical Basis Comments**

**Comment 11:**

**Cover Page:** The facility mailing address is incorrect. It should read, “8000 South Federal Way, Boise, ID 83707.”

**Response to 11:**

The facility mailing address has been changed as requested.

**Comment 12:** [Section] 1.0. The cite in the last sentence of the second paragraph should be, "**IDAPA 58.01.01.300.**"

**Response to 12:** The citation has been corrected.

**Comment 13:** [Section] 2.0. The Summary of Events and Permitting History should include the September 12, 2002, Tier I operating permit application update submitted by MTI.

**Response to 13:** The September 12, 2002 application submittal has been added to the summary of events.

**Comment 14:** [Section] 5.1.2.2. Permit Condition 2.8 is misquoted. It should read, "The permittee shall conduct a *quarterly* facility-wide inspection of potential sources of visible emissions.

**Response to 33:** Section 5.1.2.2 has been revised as requested.

**Comment 15:** [Section 5.1.6]. The Draft Permit incorrectly cites Section 3.4 here. It should read, "Permit Condition 3.3 provides addresses. Additionally, the words "the date of construction, reconstruction" should be deleted from the end of the first sentence. These are not applicable requirements. Please see MTI's previous comments on this issue dated September 13, 2002.

**Response to 15:** Section 5.1.6 has been revised and now references Permit Condition 3.3. Notification of construction has already been completed, therefore, the sentence has been revised as requested, but only with regard to construction. Should any NSPS-affected boiler ever be reconstructed, notification is required.

**Comment 16:** [Section 5.1.7]. The Draft Permit incorrectly cites Section 3.5 here. It should read, "Permit Condition 3.4 requires recordkeeping . . ."

**Response to 16:** Section 5.1.7 has been revised and now references Permit Condition 3.4.

**Comment 17:** [Section] 5.1.8. This section of the Technical Basis should be deleted. This is not an applicable requirement.

**Response to 17:** No standard of performance, pursuant to 40 CFR 60, Subpart Dc, applies to any natural gas-fired boiler. Consequently, certification of compliance with an applicable standard also does not apply. The reference to 40 CFR 60.11(g) has been deleted.

**Comment 18:** [Section] 5.1.9. This section of the Technical Basis should be deleted. This is not an applicable requirement.

**Response to 18:** Because no standard of performance applies to any natural gas-fired boiler, circumvention of an applicable standard cannot occur. Therefore, the reference to 40 CFR 60.12 has been deleted.

**Comment 19:** [Section] 5.2. The Technical Basis should reference, or include as an attachment, the October 28, 1999, memorandum from Lisa Kronberg to Yihong Chen, which clearly describes the intent and how to interpret the conditions of MTI's voluntary consent order. (Copy attached).

**Response to 19:** The October 28, 1999 memorandum indicated above has been referenced in Section 5.2.

- Comment 20:** [Section] 5.2.2. The cite to IDAPA 58.01.01.322.01 is incorrect and should be deleted.
- Response to 20:** The correct citation is the Third Amended Consent Order dated October 7, 2002. This change has been made.
- Comment 21:** [Section] 5.2.7. The Draft Permit condition is incorrectly cited from the Third Amended Consent Order. It should state, "Each unit shall not be operated outside of the manufacturer's design capacity, 1,500 to 6,700 acfm . . ."
- Response to 21:** Section 5.2.7 has been revised to reflect a design capacity of 1,500 to 6,700 acfm.
- Comment 22:** [Section] 5.2.12. This section does not accurately reflect what is written in the Third Amended Consent Order or the Draft Permit. This section of the Technical Basis should be changed to accurately reflect what is written in the Third Amended Consent Order.
- Response to 22:** Section 5.2.12 referenced outdated language, an oversight. Section 5.2.12 has been revised and now reflects the current language in the consent order.
- Comment 23:** [Section] 5.2.13. This section of the Technical Basis is incorrect and should be deleted. This requirement is not included in the Third Amended Consent Order.
- Response to 23:** Section 5.2.13 referenced Permit Condition 4.11. Inclusion of Permit Condition 4.11 was an oversight and has since been deleted from the permit.

**END OF COMMENTS**